EXISTING LEVELS OF SERVICE

SYNCHRO, a traffic modeling/analysis program, was used to evaluate existing traffic conditions at critical intersections in the study area. The existing traffic volumes, lane configurations[1] and signal timings were entered into SYNCHRO to develop a base case, existing conditions model. SimTraffic, SYNCHRO's associated traffic simulation software, was used to assist in the development of a model that replicates accurately existing conditions.

SimTraffic outputs were used to determine the existing level of service (LOS) and the delay per vehicle for all the critical intersections in the study area. LOS is an indicator of the operating conditions which occur on a roadway under different volumes of traffic and is defined in the 2000 Highway Capacity Manual by six levels, "A" to "F". A number of operational factors can influence the LOS including geometry, travel speeds, delay, and the number of pedestrians crossing the intersections.

LOS "A" represents the best operating conditions and is an indicator of ideal travel conditions with vehicles operating at or above posted speed limits with little or no delays. Conversely, LOS "F" generally indicates forced flow conditions illustrated by long delays and vehicles queues. Level of Service "C" indicates a condition of stable flow and is generally considered satisfactory in rural areas. Under LOS "D" conditions, delays are considerably longer than under LOS "C", but are generally considered acceptable in urban areas. At LOS "E" the roadway begins to operate at unstable flow conditions as the facility is operating at or near its capacity. A detailed description of the different levels of service and their associated delays for both signalized and unsignalized intersections is included in Appendix F.

The existing LOS for the AM and PM peak hours for the study area intersections is presented in Figure 18. As shown in the figure, most of the intersections experience more congestion during the PM peak hour than during the AM peak hour.

As displayed in the figure, the intersections that operate at LOS F during both the AM and PM peak hours are Blair Road at Piney Branch Road, Blair Road at Cedar Street and New Hampshire Avenue at Eastern Avenue. At the intersection of Blair Road Piney Branch Road, left turn vehicles blocking through traffic is one of the reasons for vehicular delays and poor level of service. At the intersection of Blair Road and Cedar Street/4th Street the complicated geometry of the intersection and the large volumes of traffic traversing it during the peak hours are factors that make the intersection operate at LOS F.

Most of the intersections on Georgia Avenue operate at LOS F during the AM or PM peak hours. The intersection of Georgia Avenue at Elder Street operates at LOS F during the AM peak hours. The poor level of service is the result of blockages of Georgia Avenue traffic due to the vehicle inspections at the entrance to the Walter Reed Army Medical Center. Delays at the intersection of Piney Branch Road and Georgia Avenue are significant during the PM peak hour due in part to the complicated geometry and the large volumes traversing this location. The intersection of Carroll Street with Eastern Avenue and Willow Street operates at LOS F during the PM peak hour. Signal timing optimization may help improve the level of service at this intersection.

[1] The lane configurations for the study area intersections are summarized in Appendix E

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Figure 18. Existing Levels of Service

With regards to unsignalized intersections, those performing at the worst LOS include Eastern Avenue at Kansas Avenue (PM peak hour), Eastern Avenue at Laurel Street (AM peak hour), and Georgia Avenue at Fern Street (AM peak hour).

The Study Team used existing level of service information to identify locations where future improvements - such as signalization, changes in signal timing/phasing and/or turn lanes – could be implemented. Detailed descriptions of all of the transportation issues identified in the study area are provided in the Summary of Study Area Transportation Issues and Recommendations section of this report.

PEDESTRIAN CIRCULATION AND FACILITIES

The Study Team conducted a comprehensive survey of the existing pedestrian facilities. In the initial survey the Study Team determined the locations and widths of existing sidewalks in the study area. After meeting with citizens and hearing their concerns, the Study Team conducted more detailed field assessments of the pedestrian facilities in a one-half mile radius surrounding the Takoma Metro Station. The items reviewed included: the conditions of the sidewalks, the sidewalk material, and the locations and widths of any buffer between the curb and sidewalk. This review also located disabled access ramps and assessed connectivity of ramps with respect to each other and the other pedestrian features.

Pedestrian Circulation

The majority of the study area is residential. There are a variety of significant pedestrian destinations which include: the Takoma Metro Station, primary and secondary schools, colleges, places of worship, post offices, libraries, theaters and community recreation centers. These locations are connected by a sidewalk network made up of different materials (i.e. brick and concrete pavers) in a range of conditions (between good and poor).

Some of the smaller and denser residential areas have no sidewalks on either side of the street, particularly in the neighborhoods to the west of the train tracks. Other sections have incomplete sidewalks with varying levels of continuity between them. Still others have fairly new sidewalks on both sides of the street with considerable care being given to upkeep, sidewalk width and disabled ramps.

Figure 19 identifies pedestrian destinations and sidewalk widths within the study area. Some general observations made regarding the sidewalk circulation in the area include:

- Sidewalks tend to be wider directly adjacent to the different major destinations, especially educational institutions.
- More highly utilized roadways, such as Blair Road and Eastern Avenue, do not have sidewalks along their entire length.
- Sidewalks tend to be wider in the residential areas of the Takoma section of DC than in residential areas of Takoma Park, Maryland.

Click to View:

Figure 19. Existing Pedestrian Facilities

Pedestrian crossings are primarily regulated by properly placed crosswalks in conjunction with appropriate pedestrian signals throughout the study area. Most of the signalized intersections also contain pedestrian signals with the exception of the following locations:

- Georgia Avenue at Van Buren Street – missing NB/SB pedestrian signals
- Philadelphia Avenue at Piney Branch Road – missing NB/SB/EB pedestrian signals
- Georgia Avenue at Aspen Street – missing pedestrian signal head at WB sidewalk heading north
- Carroll Street at Cedar Street – missing SB/WB pedestrian signals
- Philadelphia Avenue at Maple Avenue – missing one pedestrian signal

Pedestrian Counts

The Study Team also conducted an assessment of the peak period pedestrian activity in the study area during which time individuals were stationed at intersections to count the number of pedestrians crossing the street. The intersections counted are indicated on Figure 20 along with the results of the counts. As expected, during the peak hours there were higher numbers of pedestrians crossing roadways in the area nearest the Metro Station. Since pedestrian activity has an effect on traffic operations, the pedestrian count information was used as an input in the development of the existing conditions AM and PM peak hour traffic model.

Sidewalk and Buffer Materials and Conditions

Notwithstanding other codes and standards, the Americans with Disabilities Act (ADA) set up guidelines for providing equal, or at the least, reasonable, access for individuals with disabilities to major public destinations. ADA regulations require that the flat area of disabled ramps have a minimum width of 3 feet – 4 inches; however, in the State of Maryland, new measures are being taken to upgrade pedestrian and disabled access along certain non-limited access roadways to a minimum 4’ flat ramp width during re-development efforts and for new designs. The wider ramps allow for easier maneuverability for individuals in wheelchairs or utilizing motorized scooters.

The Study Team conducted a field survey of the existing sidewalk materials and conditions and noted any buffer area between the curbside and the sidewalk. The condition of the sidewalk directly relates to the degree of accessibility for individuals with disabilities. The type and size of the buffer area is important for helping to explain the level of comfort individuals have when walking through that area.

The sidewalk buffers range between zero and 10 feet wide. Most of the buffer areas are composed of grassy strips and widely spaced trees of various sizes. Many of the denser residential areas in Takoma Park, Maryland have minimal sidewalk buffers, if at all, and thus tend to have no buffers between the curbline and the sidewalks.

Click to View:

Figure 20. Existing (2002) Peak Hour Pedestrian Counts

Most of the sidewalks in the study area are composed of concrete and are in fair to good condition. There are a few locations where the concrete has begun to deteriorate significantly such that a disabled user would have problems maneuvering through the area. The brick sidewalks are primarily located in the commercial areas and tend to be in fair to good condition as well. One of the most notable problems arising with the brick sidewalks is the tendency for individual bricks to become loose, creating a hazardous pedestrian situation and warranting a lower rating by the Study Team. Another common cause for poor ratings of sidewalks was tree roots invading the sidewalk space, particularly in the District of Columbia.

The Study Team rated the sidewalks within one-half mile of the Takoma Metro Station in the following manner:

- Good – generally smooth surface with little to no uplifting or depressions, and no loose concrete or gravel. Newer looking sidewalks fell into this category.
- Fair – minor uplifting and minor depressions with some visible broken and loose gravel, and minor vegetation growth seeping through the seams.
- Poor – major uplifting and depressions, missing sections, broken and/or missing concrete or brick, with large tree roots and other vegetation coming through the seams.

As Table 8 indicates, most of the sidewalks in the vicinity of the Metro Station are in good condition. However, there are street sections with no sidewalk or sidewalks in poor conditions. The Summary of Study Area Transportation Issues and Recommendations section of this report includes recommendations to address these deficiencies.

Table 8
Sidewalk and Buffer Conditions within One-Half Mile of the Takoma Metro Station

Primary Roadway	Limits	Buffer Width	Sidewalk Material & Condition
Hemlock St	8th St to Eastern Ave	No Buffer	No Sidewalk
Geranium St	Georgia Ave to Blair Rd	No Buffer	No Sidewalk
Fern Pl	Georgia Ave to Blair Rd	2 ½ - 3’	Concrete, Fair Condition.
Elder St	Georgia Ave to 7th St	2½’ – 4’	Concrete, Good Condition.
Dogwood St	9th St to 8th St	2 ½’	Concrete, Good Condition.
Dahlia St	Georgia Ave to 9th St 8th St to 5th St	0 – 4 ½’ 0 – 5’	Concrete, Good Condition. Concrete, Fair Condition.
Highland Ave	9th St to Piney Branch Rd	No Buffer	Concrete, Good Condition.
Cedar St	Piney Branch Rd to Blair Rd	0 – 4 ½’	Concrete, Good Condition.
Butternut St	Georgia Ave to 5th St 5th St to 4th St. 4th St to Blair Rd	3 ½’ - 4 ½’ 3’ No Buffer	Concrete, Good Condition. Concrete, Fair Condition. Brick, Fair Condition.
Aspen St	Georgia Ave to Piney Branch Rd Piney Branch Rd to 4th St 4th St to Laurel St	3 ½’ – 4’ 3 ½’ – 4’ 2’ – 5½’	Concrete, Good Condition. Concrete, Fair Condition. Concrete, Good Condition.
Whittier St	Georgia Ave to Piney Branch Rd. Piney Branch Rd to Blair Rd Sandy Spring Rd to 2nd St 1st St to Harlan Pl	2 ½’ 3 ½’ - 5½’ 4½’ 3’ – 4½’	Concrete, Fair Condition. Concrete, Good Condition. Concrete, Fair Condition. Concrete, Fair Condition
Van Buren St	8th Street to 7th St and 6th to Blair Rd 7th to 6th St Railroad Tracks to Harlan Pl	3’ – 5’ 3 ½’ – 5 ½’ 3 – 4’	Concrete, Good Condition Concrete, Fair Condition. Concrete, Good Condition.
Carroll Ave	RR Tracks to Tulip Ave	No Buffer	Brick, Good Condition.
Walnut St	Laurel St to 2nd St 2nd St to Eastern Ave	3’ 3’	Concrete, Good Condition. Concrete, Poor Condition.

Table 8
Sidewalk and Buffer Conditions within One-Half Mile of the Takoma Metro Station (Continued)

Primary Roadway	Limits	Buffer Width	Sidewalk Material & Condition
Walnut Ave	Eastern Ave to Westmoreland Ave	2’	Concrete, Good Condition.
Maple St	Sandy Spring Rd to Carroll Ave	0 – 3’	Concrete, Fair Condition.
Willow St	Sandy Spring Rd to Eastern Ave	0 – 2’	Concrete, Good Condition.
Laurel St	Sandy Spring Rd to Eastern Ave Eastern Ave to Tulip Ave	2’ – 3’ No Buffer	Concrete, Good Condition Brick, Good Condition.
Sandy Spring Rd	Maple St to Van Buren St	No Buffer	No Sidewalk
2nd St	Laurel St to Walnut St Walnut St to Van Buren St	3’ 2’ – 4’	Concrete, Poor Condition. Concrete, Fair Condition.
Underwood Pl	Whittier Street to Van Buren St	3’	Concrete, Fair Condition.
Eastern Ave	Cedar Ave to Piney Branch Rd Carroll Ave to Whittier St	No Buffer 0 – 3’	Concrete, Fair–Good Condition Concrete, Good Condition.
Blair Rd	Eastern Ave to Cedar St Cedar St to Underwood St	0 – 7’ No Buffer	Brick, Good Condition Concrete, Good Condition
Georgia Ave	Fern Pl to Aspen St	0 – 4’	Concrete, Good Condition
9th St	Aspen St to Dogwood St Dogwood St to Elder St Geranium St to Hemlock St	2’ – 3’ 2 ½’ 4’	Concrete, Fair Condition Concrete, Good Condition Concrete, Fair Condition
8th St	Aspen St to Elder St Elder St to Hemlock St	3’ – 5’ 5’	Concrete, Good Condition Concrete, Fair Condition
7th St	Underwood St to Whittier St Dahlia St to Fern St	2 ½’ – 3 ½’	Concrete, Fair Condition
7th Pl	Van Buren St to Whittier St	0 – 2 ½’	Concrete, Good Condition
6th St	Underwood St to Aspen St Aspen St to Cedar St	2½’ – 5½’ 2’ – 4’	Concrete, Good Condition Concrete, Fair Condition
5th St	Underwood St to Cedar St Cedar St to Dahlia St	4’ 5’	Concrete, Good Condition Concrete, Fair Condition
4th St	Van Buren St to Aspen St Aspen St to Blair Rd	4’ – 5’ No Buffer	Concrete, Good Condition Brick, Good Condition
Piney Branch Rd	Philadelphia Ave to Tulip Ave	0 – 3’	Concrete, Fair Condition
Holly Ave	Eastern Ave to Dogwood St Dogwood St to Philadelphia Ave	0 – 4’ 0 – 1’	Concrete, Good Condition Concrete, Fair Condition
Birch Ave	Cedar Ave to Philadelphia Ave	0 – 2’	Concrete Good Condition
Cedar Ave	Carroll Ave to Tulip Ave Tulip Ave to Philadelphia Ave	3’ 0 – 3’	Concrete, Fair Condition Concrete, Good Condition
Maple Ave	Carroll Ave to Philadelphia Ave	0 – 2’	Concrete, Fair Condition
Willow Ave	Carroll St to Philadelphia Ave	4’ – 8’	Concrete, Fair Condition
Spruce Ave	Tulip Ave to Park Ave	0 – 6’	Concrete, Good Condition
Tulip Ave	Holly Ave to Cedar Ave Cedar Ave to Carroll Ave	0 – 2’ 2’ – 4’	Concrete, Good Condition Concrete, Fair Condition

Disabled Access

The Study Team conducted a detailed assessment of the existing disabled access facilities for the area within one-half mile of the Takoma Metro Station. The major items under review were: existing ramp locations, ramp connectivity, and ramp widths. Figure 21 depicts disabled ramp types within one-half mile of the Takoma Metro Station. Most corners were observed to have handicapped ramps of varying widths. The ramps were measured to determine if the flat widths were greater or less than the preferred minimum 4-feet width.

Notwithstanding other codes and standards, the Americans with Disabilities Act (ADA) set up guidelines for providing equal, or at the least, reasonable, access for individuals with disabilities to major public destinations. ADA regulations require that the flat area of disabled ramps have a minimum width of 3 feet – 4 inches; however, in the State of Maryland, new measures are being taken to upgrade pedestrian and disabled access along certain non-limited access roadways to a minimum 4' flat ramp width during re-development efforts and for new designs. The wider ramps allow for easier maneuverability for individuals in wheelchairs or utilizing motorized scooters.

In both the District of Columbia and in Maryland, there is evidence of recent widening and upgrading of sidewalks and disabled access ramps, although there are more upgrades noted in the District. There are primarily two different ramp configurations observed in both jurisdictions. The double ramp configuration, shown in Figure 22, provides two perpendicular ramps on a single corner that allows the user to mount a ramp and then turn 90 degrees to wait for the opposing pedestrian signal to change. The single corner ramp configuration, shown in Figure 23, places a single, larger ramp directly at the corner of the intersection. The user can mount the ramp and turn to wait for the signal change without having to maneuver onto a second ramp. Both configurations are utilized in both jurisdictions with single corner ramps being used primarily at the "T" intersections.

Click to View:

Figure 21. Disabled Access Surrounding Metro Station Area

Figure 22
Double Ramp Configuration

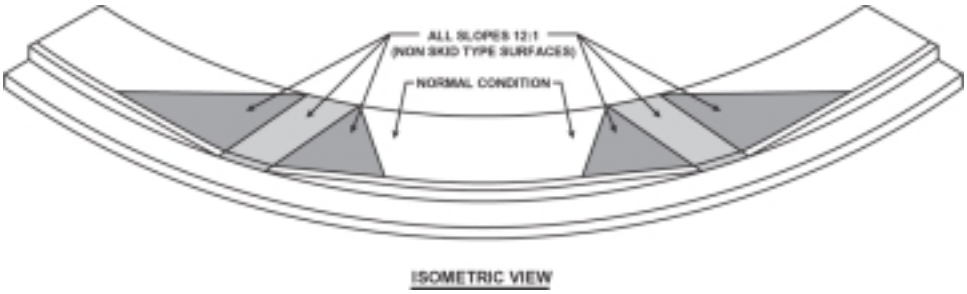
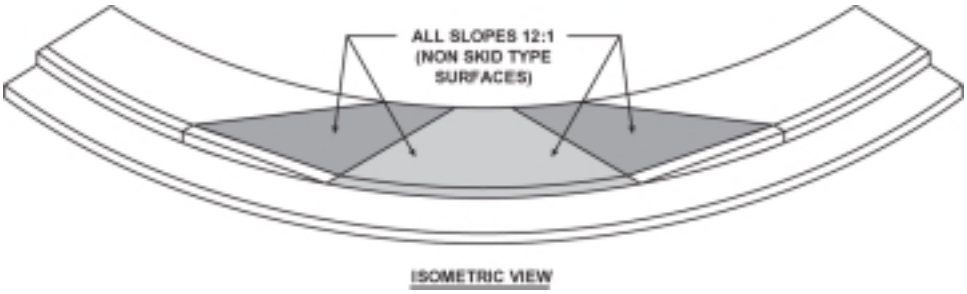


Figure 23
Single Corner Ramp Configuration



Most crosswalks are striped; although there are several locations where the striping does not properly coincide with the ramp locations. This unmatched striping was especially significant with the single corner ramp configuration where improper placement would guide the user into the middle of an intersection in order to access the ramp.

Several sidewalks are not disabled accessible within the study area. In the District of Columbia, 9th Street has the most consecutive inaccessible intersections: Highland Avenue, Dahlia Street, Dogwood Avenue, and Elder Street all of which have no handicapped ramp access at all. All of the other north-south roadways in the District have ramped access for their entire limits.

There are locations where the user does not have continuous access to the same side of the street for the entire length of the roadway. In these locations, the user has to cross over the roadway and use the ramps on the other side of the street to continue in the same direction. This scenario was usually observed in locations where remaining on a particular side of the street to cross would be seen as undesirable (i.e., locations where the user may not be visible to drivers if they stayed on that side of the street, or locations where there are several driveways or other obstructions to sight).

The lack of continuous access was observed at the following locations:

1. Van Buren Street at 4th Street
2. Highland Avenue at 8th Street
3. Elder Street at 7th Street